REMARKS

Applicants' attorney acknowledges with appreciation, the courtesy of Examiner Patterson in discussing the issues in the Proposed Amendment on 6/14/05. It is believed that the discussion has materially advanced the prosecution of this application.

The Official Action and the objection under 132 and rejection under 101 and the first paragraph of 112 have been carefully reviewed. It is noted that no prior art rejections apply. Accordingly, the review indicates that the claims, especially as amended, recite patentable subject matter and should be allowed. Reconsideration and allowance are respectfully requested.

In advance of contending with the rejections made, a summarization of the essentials of the novel thermostable GuxA polypeptide heterologously expressed in an organism other than Acidothermus cellulolyticus, as well as variants and derivatives thereof will be set forth to establish: clear lines of distinction between co-pending Application No. 09/917,384; the basis for specific substantial asserted utility or well established utility; and to contend with the rejections under the first paragraph of 35 USC 112.

During fermentation for producing ethanol from biomass, where one of the major expenses incurred in SSF is the enzyme cost, and where there is a need to generate alternative cellulase enzymes other than those expressed in *Acidothermus cellulolyticus* (capable of use in commercial-scale processing of cellulose to sugar for use in bio-fuel production), applicants are the first to invent a novel GuxA member of the glycoside hydrolase (GH) family of enzymes, which is a thermal tolerant glycoside hydrolase, useful in the degradation of cellulose.

The GuxA polypeptides of the invention include those having an amino acid sequence shown in SEQ ID NO:1, as well as polypeptides having substantial amino acid sequence identity

to the amino acid sequence of SEQ ID NO:1 and useful fragments thereof, including, a first catalytic domain having significant sequence similarity to the GH6 family, a second catalytic domain having significant sequence similarity to the GH12 family, a first cellulose binding domain (type II) and a second cellulose binding domain (type III).

The invention further provides a polynucleotide molecule encoding GuxA polypeptides and fragments of GuxA polypeptides, for example, catalytic and cellulose binding domains. Polynucleotide molecules of the invention include those molecules having a nucleic acid sequence as shown in SEQ ID NO:2; those that hybridize to the nucleic acid sequence of SEQ ID NO:2 under high stringency conditions; and those having substantial nucleic acid identity with the nucleic acid sequence of SEQ ID NO:2.

Claims 1-23, 27-35, 43, 44, 48-54 and 58-75 were provisionally rejected under 35 USC 101 on the allegation that the invention claimed is the same invention as claimed in claims 1-11, 26, 27, 36-43, 44, 45 and 69-74 of co-pending Application No. 09/917,384. Applicants respectfully traverse this allegation and request reconsideration for the following reasons:

Review of the sequence listing for SEQ ID NO: 1, which is for Thermal Tolerant Cellulase from *Acidothermus cellulolyticus* clearly establishes that it has 1228 amino acid residues. By contrast, SEQ ID NO: 1 for co-pending serial no. 09/917,384 is for Thermal Tolerant Exoglucanase from *Acidothermus cellulolyticus*, and has 1121 amino acid residues. Written and CRF versions of these sequence listings are submitted herewith in confirmation of the foregoing facts, so as to establish, contrary to the allegation made in the Official Action, that SEQ ID NOS: 1 of these two applications are not in fact identical.

However, if it is still insisted that they are significantly identical, it is by established law appropriate to accept the enclosed Terminal Disclaimer. Withdrawal of this provisionally rejected double patenting rejection is respectfully requested.

Claims 27-28, 35, 43-44, 48-54 and 63-68 were rejected on allegations that the claimed invention is not supported by either a specific substantial asserted utility or a well established utility under 35 USC §101.

Applicants respectfully traverse this rejection and request reconsideration for the following reasons. These claims pertain to the polypeptide comprising sequence identification no. 4,7, 5, 8 and 1 and were initially claimed and have at least 70% identity with these sequences "and having at least one domain of glycosyl hydrolase family 6 and glycosyl hydrolase family 12". However, as is pointed out on page 32, lines 17-20 – as well as Example 2 and in Tables 3 and 4, these amino acid sequences predicted by Sequence Identification No. 1 was determined to have significant homology to known cellulases – and, in the paragraph bridging pages 18 and 19 of the specification, it is clearly shown that homology can exist for at least about 60% identity up through 90% identity utilizing well known prior art criteria to compare polypeptide sequences at least as early as 1981. Accordingly, the suggested phraseology in the Office Action that 95% homology is necessary to allow for allelic variance is not the established or recognized standard in the art. Nevertheless, applicants have limited these claims to about 90% sequence identity, as this is a basis present in the application as initially filed, and should not raise the specter of new matter.

Withdrawal of the rejection is respectfully requested.

Claims 27-28, 35, 43-44, 48-54 and 63-68 were rejected on allegations that these claims are not supported by either a asserted utility or well established utility so as to enable one

skilled in the art to know how to use the claimed invention; however, applicants respectfully traverse this rejection for the reason that, under the Summary of the Invention section and elsewhere throughout the specification, the "GuxA" is stated to have utility in the degradation of cellulose when administered to a biomass containing cellulose for reduction or degradation of the cellulose. Also, on page 9 of the specification, it is stated that ' "Cellulase activity" refers to any activity that can be assayed by characterizing the enzymatic activity of a cellulase. Thus, cellulase activity can be assayed by determining how much reducing sugar is produced during a fixed amount of time for a set amount of enzyme (see Irwin et al., (1998) J. Bacteriology, 1709-1714). Other assays are also well known in the art and can be substituted'. Accordingly, cellulase activity is a well established utility. Further, under the INDUSTRIAL APPLICATIONS section of the specification it is stated that the GuxA polypeptides are effective cellulases for degrading cellulase by treating biomass "at a ratio of about 1 to about 50 of the GuxA: biomass." Further still, as disclosed throughout in the specification, significant amino acid similarity of GuxA to other cellulases identifies GuxA as a cellulase and GuxA has two catalytic domains identified as belonging to the GH6 and the GH12 families, and it is well established that GH6 members degrade a cellulase substrate using an inverting mechanism and GH12 degrades cellulose using a retaining mechanism.

Therefore, for at least the foregoing reasons (since the specification also disclose the use of GuxA polypeptide as a pharmaceutically acceptable carrier, for inclusion in detergents, for stonewashing jeans and biopolishing) there is unmistakably specific substantial asserted utility and well established utility.

Withdrawal of the rejection is respectfully requested.

Claims 27-28, 35, 43-44, 48-54 and 63-68 were rejected under the first paragraph of 35 USC 112 on allegations that these claims are not supported by either a asserted utility or a well established utility for reasons set forth above; however, applicants would refer the Examiner the two preceding paragraphs where it is established throughout the specification, that support for both asserted utility and well established utility is unmistakable. Withdrawal of the rejection is respectfully requested.

Claims 27-28, 35, 43, 44, 48-54 and 63-68 were rejected under the first paragraph of 35 USC §112 on allegations of failing to comply with the enablement requirement; however, contrary to the assertions made in this rejection, the specification does teach one of ordinary skill in the art that the percentage identity may constitute homology from about 60% identity to about 90% identity in the paragraph bridging pages 18 and 19. Nevertheless, applicants have amended these claims to recite about 90% identity even though homology is established with amino acid sequence GuxA polypeptides from about 60 to about 90% - therefore, a requirement of 95% identity in order to allow for allelic variance is clearly not the recognized standard in the prior art.

The amendment to FIG. 2 was objected to under 35 USC §132 on allegations of introducing new matter; however, the submission of FIG. 2 is not in fact an amendment, but better focusing of the characters not initially focused on the initial copy of FIG. 2 originally filed in the Patent Office. The Office Action required a clearer or better focused copy, and the same was provided consistent with the requirement. Accordingly, the objection in the face of compliance does not constitute the introduction of new matter.

In view of the foregoing amendments, remarks and arguments, and in view of the written and CRF submissions and Terminal Disclaimer, it is believed that the application is now in condition for allowance and early notification of the same is earnestly solicited.

Respectfully submitted,

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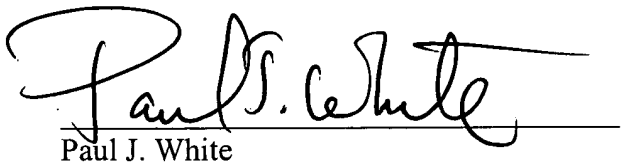

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